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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/767,659	01/22/2001	Richard N. Savage	A-67736-1/AJT/MSS	2896

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EXAMINER

FOX, CHARLES A

ART UNIT

PAPER NUMBER

3652

DATE MAILED: 12/31/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/767,659

Applicant(s)

SAVAGE ET AL.

Examiner

Charles A. Fox

Art Unit

3652

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10-07-02.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 19-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 19-24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 January 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or
(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

Claim 24 is rejected under 35 U.S.C. 102(e) as being anticipated by Suda et al. Suda et al. (US 6,053,980) teaches the method of semiconductor processing comprising the steps of :

providing an atmospheric front end unit (100) including a robot (20) for transporting a wafer;

a multi chamber module (100) including a plurality of vertically stacked wafer process chambers (90);

a loadlock chamber (52) for each process chamber(90);

a wafer transfer apparatus (54) for each loadlock (52) with each transfer apparatus being dedicated to a respective process chamber;

transporting a wafer from said atmospheric chamber into said load lock via said robot;

transferring said wafer from said loadlock to said process chamber via said transfer apparatus.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 19-21 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aswad in view of Hiroki. In regards to claim 19 Aswad (US 6,073,366) teaches a method of semiconductor wafer processing comprising the steps of:

providing a loadlock chamber (22), having transfer arm (24,26) for carrying processed and unprocessed wafers;
a wafer process chamber (122).

Aswad does not teach the two wafer transfer arms (24,26) as being able to simultaneously move a processed wafer and an unprocessed wafer from the loadlock chamber to the process chamber. Aswad further teaches that many types of wafer handling devices can be used with their invention. Hiroki (US 5,989,346) teaches a wafer transfer arm (20) with a lower wafer support (26) and an upper wafer support (25), that allow a processed wafer and an unprocessed wafer to be exchanged between the process chamber and the transfer chamber. It would have been obvious to one of

ordinary skill in the art, at the time of invention that the wafer handling device taught by Hiroki could have been used in the apparatus taught by Aswad to allow simultaneous transfer of wafers between the process chamber and the transfer chamber, thereby decreasing the cycle time for transfer of the wafers.

In regards to claim 20 Hiroki further teaches that the transfer chamber (5) can be set at a reduced pressure. See column 7 lines 21 and 22. It would have been obvious to one of ordinary skill in the art, at the time of invention that the transfer chamber taught by Aswad could be placed under a vacuum as taught by Hiroki in order to match the conditions of the process chamber during transfer of wafers.

In regards to claim 21 Aswad further teaches the providing step also includes providing a cooling plate (48) in the transfer chamber (22), and said method further comprises placing a processed wafer to said cooling plate.

In regards to claim 23 Aswad also teaches the steps of:

receiving an unprocessed first wafer on the transfer arm;

transferring said first wafer to a process chamber;

concurrently processing said first wafer and receiving a second wafer on the transfer arm;

Aswad does not teach the method of retrieving said first wafer from the process chamber while holding said second wafer on the transfer arm. Hiroki teaches a method where the transfer arm can hold a second wafer while retrieving a first wafer from a process chamber. It would have been obvious to one of ordinary skill in the art, at the time of invention that combining the transfer arm of Hiroki with the apparatus of Aswad

would allow a method where the device could transfer wafers from a process chamber and a storage chamber simultaneously so as to increase the throughput of the apparatus.

Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Aswad in view of Hiroki as applied to claim 21 above, and further in view of Sinha et al. Aswad in view of Hiroki teach the limitations of claim 21 as above, they further teaches transporting a wafer to a process chamber from a loadlock chamber. They do not teach any particular structure to the process chamber. Sinha et al. (US 5,695,568) teach a method of performing a chemical vapor deposition on a wafer, the method comprising the steps of:

transferring a wafer onto a wafer chuck (18);

raising the wafer chuck for processing the wafer with chemical vapor deposition.

While Sinha et al. do not teach a chemical vapor deposition injector, it is inherent to a chemical deposition chamber to have a chemical vapor injector as a means for introducing the chemical vapor. It would have been obvious to one of ordinary skill in the art, at the time of invention that the process chamber taught by Sinha et al. could have been used with the apparatus taught by Aswad in view of Hiroki in order to process wafers via chemical vapor deposition in a manner that is more efficient thereby increasing the throughput of the apparatus.

Response to Amendment

The amendment to the claims filed on October 7, 2002 has been entered into the record.

Response to Arguments

Applicant's arguments filed October 7, 2002 have been fully considered but they are not persuasive. In regards to the arguments for claim 24 Suda et al. US 6,053,980 does disclose "Then, the two wafers 5 are transferred from the wafer boat 70 in the load lock chamber 52 to the susceptor 90 in the reaction processing chamber 56...". See column 9 lines 16-21.

In regards to the argument for claim 19 Hiroki US 5,989,346 teaches a method of exchanging processed and unprocessed substrates at the same time in a process module. See column 13 line 21 to column 14 line 39.

In regards to claim 21 the location of the cooling plate is not considered a patentable feature as it does not change the method being carried out. As such the Aswad reference still reads upon the method as claimed in claim 21.

In regards to the arguments for claim 23 Sinha et al. US 5,695,568 teaches raising a heater plate (18) from a retracted position to allow wafers to be exposed to the process gas. See column 4 lines 31-50.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charles A. Fox whose telephone number is 703-605-4294. The examiner can normally be reached between 7:00-5:00 Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eileen D. Lillis can be reached at 703-308-3248. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-7687 for regular communications and 703-305-7687 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1113.


EILEEN D. LILLIS
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 3600

CAF
December 29, 2002